

TOSCA – SWOT Research Project

SWOTLAKE : Lake modelling at global scale



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SWOT, First Science Definition Team meeting, Pasadena, January 28-30, 2013

General context of the proposed research

Evaluate the importance of lake representation at global scale in GCMs

Main characteristics:

Lake surface represents ~3% of the continental surfaces and exhibits a high spatial variability

No prognostic lake scheme in climate (CMIP5) models

Specific physical properties :

- Albedo and Energy budget at surface/atmosphere interface
- Freezing in winter and spring thaw for high latitude lakes
- Freezing and snow modify radiative properties of the air/water interface



Target Scale:

GCM: CNRM-CM model. Horizontal mesh 50-150km



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Specific objectives and approach

Compare lake surfaces consistency from different data sources

ECOCLIMAP (CNRM) vs HYDROWEB (LEGOS) vs VIC MODEL (Wash. Uni)

Evaluate the sensitivity of the model to the seasonal variations of lake surfaces

Retrieve seasonal variations from HYDROWEB database

Evaluate the impact of these variations off-line and in the GCM



Evaluate coupling strength

Evaluation against surface temperatures, other climatologies.

Off-line versus on-line simulations (at least 30 years)



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How does the proposal fit into the issues of the SWOT Phase-A preparation?

Hydrological issues :

(3) How often must a certain location be sampled? [...]

→ to improve input lake surfaces, particularly seasonal variations



(4) What is the smallest water body that must be sampled by SWOT? [...]

→ to improve subgrid lake fraction

